

Notice of Allowability

Application No.

10/607,885

Examiner

Srirama Channavajjala

Applicant(s)

TITUS ET AL.

Art Unit

2166

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☐ This communication is responsive to 10/17/06.
2. ☐ The allowed claim(s) is/are 1,3,5-7,12-16,18,20 and 21 [re-numbered as: 1-13].
3. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some* c) ☐ None of the:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

* Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.

THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

4. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
- (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
- 1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
- (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.
- Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

- | | |
|--|--|
| 1. <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 5. <input type="checkbox"/> Notice of Informal Patent Application |
| 2. <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 6. <input checked="" type="checkbox"/> Interview Summary (PTO-413),
Paper No./Mail Date <u>10/27/06</u> . |
| 3. <input type="checkbox"/> Information Disclosure Statements (PTO/SB/08),
Paper No./Mail Date _____ | 7. <input checked="" type="checkbox"/> Examiner's Amendment/Comment |
| 4. <input type="checkbox"/> Examiner's Comment Regarding Requirement for Deposit
of Biological Material | 8. <input checked="" type="checkbox"/> Examiner's Statement of Reasons for Allowance |
| | 9. <input type="checkbox"/> Other _____ |

DETAILED ACTION

1. Claims 1,3,5-7,12-16,18,20-21 are allowed in this application.
2. Examiner acknowledges applicant's amendment filed on 10/17/2006.
3. Claims 1,15-16 have been amended on 10/17/2006.
4. Examiner acknowledges applicant's amendment filed on 6/6/2006.
5. Claims 1,7,14,15,16 have been amended [6/6/2006].

Drawings

6. The Drawings filed on 6/27/2003 are acceptable for examination purpose

Interview:

7. Applicant's Attorney LeRoy D. Maunu Regd.No. 35,274 is thanked for the telephone interview on 27 October 2006. During that telephone interview LeRoy D. Maunu granted authorization to ***amend claims 1,7,14,15,16*** and ***cancel claims 2,4,8-11,17,19.***

EXAMINER'S AMENDMENT

8. An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it **MUST** be submitted no later than the payment of the issue fee.

Authorization for this examiner's amendment was given in a telephone interview with Applicant's Attorney LeRoy D. Maunu Regd.No. 35,274, on 27 October 2006.

The application has been amended as follows:

In the Claims

1. ***(Currently amended)*** A computer-implemented method for expanding usable space for an application data file, comprising:

maintaining in a control file first and second control structures and first and second pointers to the first and second control structures, respectively, for the data file, wherein the first structure includes a plurality of pointers that respectively reference a plurality of bit maps that indicate available and allocated records of respective portions of usable space in the data file, and the second structure contains respective values that indicate quantities of available space in the respective portions of the data file;

Art Unit: 2166

limiting access to the first and second control structures to only a process that is expanding the data file while the process is expanding the data file;

allocating space for new versions of the first and second control structures in the control file;

copying contents of the first and second control structures to space for the new versions of the first and second control structures; **[[and]]**

updating the first and second pointers to reference the new versions of the first and second control structures**[[.]]**;

determining whether the first structure is large enough to accommodate expansion of the data file by a requested amount; and

performing the steps of allocating, copying, and updating only if the first structure is not large enough to accommodate expansion of the data file by the requested amount;

maintaining in-memory copies of the first and second pointers while the application data file is available for access; and

updating the in-memory copies of the first and second pointers to reference the new versions of the first and second control structures.

2. (Cancelled)

3. (Original) The method of claim 1, wherein in a multi-host data processing arrangement for sharing the application data file, the method further comprises, after a

Art Unit: 2166

first host completes expanding the data file, transmitting a message from the first host to each other host, wherein the message indicates that the file has been expanded.

4. (Cancelled)

5. (Original) The method of claim 1, wherein a plurality of application programs share the data file and are hosted on a plurality of host data processing systems (hosts), the method further comprising conditioning expansion of a file shared by the application program on whether each host is configured to detect expansion of the data file by another host.

6. (Original) The method of claim 5, further comprising, before expanding the data file by a first host, sending to each other host a message that queries whether the other host is configured to detect expansion of the data file by another host.

7. (Currently amended) A computer-implemented method for expanding usable space for an application data file, comprising:

maintaining an in-memory copy of one or more selected control structures from a control file while the application data file is available for access, wherein the application file is logically divided into a plurality of equal-size cells, and each cell provides storage for one or more records of data;

maintaining in the control file a first structure that contains pointers to second and third structures in the control file, wherein the second structure includes a plurality of pointers that respectively reference bit maps of the cells of the application file, each bit map indicating available and allocated records in the cell, and the third structure contains respective values that indicate quantities of available space in the cells, and;

determining whether the second structure is large enough to accommodate expansion of the data file by a requested amount;

in response to the second structure not being large enough to accommodate expansion of the data file by the requested amount, performing the steps of,

locking the first and third structures within the control file;

allocating in the control file space for a fourth structure and space for a fifth structure, wherein the space allocated for the fourth structure is greater than space occupied by the second structure, and the space allocated for the fifth structure is greater than space occupied by the third structure;

copying data from the second structure to the fourth structure and data from the third structure to the fifth structure;

updating in the first structure respective pointers to the second and third structures to reference the fourth and fifth structures, respectively; and

unlocking the first structure and the third structure after the pointers have been updated.

wherein in a multi-host data processing arrangement for sharing the application data file, the method further comprises, after a first host completes expanding the data

file, transmitting a message from the first host to each other host, wherein the message indicates that the file has been expanded;

wherein each host receiving a message that indicates that a file has been expanded, performs the steps of,

locking the in-memory version of the third structure;

updating the in-memory versions of the pointers to the control file versions of the second and third structures, with the control file versions of the pointers to the control file versions of the second and third structures;

copying the contents of the third structure in the control file to the in-memory version of the third structure; and

unlocking the third structure after copying is complete.

8-11. **(Cancelled)**

12. (Original) The method of claim 7, wherein a plurality of application programs share the data file and are hosted on a plurality of host data processing systems (hosts), the method further comprising conditioning expansion of a file shared by the application program on whether each host is configured to detect expansion of the data file by another host.

13. (Original) The method of claim 12, further comprising, before expanding the data file by a first host, sending to each other host a message that queries whether the other host is configured to detect expansion of the data file by another host.

14. **(Currently amended)** An apparatus for expanding usable space for an application data file, comprising:

means for maintaining an in-memory copy of one or more selected control structures from a control file while the application data file is available for access, wherein the application file is logically divided into a plurality of equal-size cells, and each cell provides storage for one or more records of data;

means for maintaining in the control file a first structure that contains pointers to second and third structures in the control file, wherein the second structure includes a plurality of pointers that respectively reference bit maps of the cells of the application file, each bit map indicating available and allocated records in the cell, and the third structure contains respective values that indicate quantities of available space in the cells, and;

means for determining whether the second structure is large enough to accommodate expansion of the data file by a requested amount;

means, responsive to the second structure not being large enough to accommodate expansion of the data file by the requested amount,

[[means]] for locking the first and third structures within the control file;

[[means]] for allocating in the control file space for a fourth structure and space for a fifth structure, wherein the space allocated for the fourth structure is greater than space occupied by the second structure, and the space allocated for the fifth structure is greater than space occupied by the third structure;

[[means]] for copying data from the second structure to the fourth structure and data from the third structure to the fifth structure;

[[means]] for updating in the first structure respective pointers to the second and third structures to reference the fourth and fifth structures, respectively; and

[[means]] for unlocking the first structure and the third structure after the pointers have been updated.

means, responsive to a request that references an entry in the in-memory version of the third structure,

for locking the third structure;

for comparing a control file version of the pointer to the control file version of third structure, to an in-memory version of the pointer to the control file version of the third structure;

for updating the in-memory versions of the pointers to the control file versions of the second and third structures, with the control file versions of the pointers to the control file versions of the second and third structures, if the control file version and in-memory version of the pointer are not equal;

for copying the contents of the third structure in the control file to the in-
memory version of the third structure; and
for unlocking the third structure after the copying of the contents of the
third structure.

15. **(Currently amended)** An apparatus for expanding usable space for an application data file, comprising:

means for maintaining in a control file first and second control structures and first and second pointers to the first and second control structures, respectively, for the data file, wherein the first structure includes a plurality of pointers that respectively reference a plurality of bit maps that indicate available and allocated records of respective portions of usable space in the data file, and the second structure contains respective values that indicate quantities of available space in the respective portions of the data file;

means for determining whether the first structure is large enough to
accommodate expansion of the data file by a requested amount; and

means, responsive to the first structure not being large enough to accommodate
expansion of the data file by the requested amount,

[[means]] for limiting access to the first and second control structures to only a process that is expanding the data file while the process is expanding the data file;

[[means]] for allocating space for new versions of the first and second control structures in the control file;

[[means]] for copying contents of the first and second control structures to space for the new versions of the first and second control structures; and

[[means]] for updating the first and second pointers to reference the new versions of the first and second control structures[[.]];

means for maintaining in-memory copies of the first and second pointers while the application data file is available for access; and

means for updating the in-memory copies of the first and second pointers to reference the new versions of the first and second control structures.

16. **(Currently amended)** An article of manufacture for expanding usable space for an application data file, comprising:

a computer-readable storage medium configured with instructions that cause a processor-based system to perform the steps of,

maintaining in a control file first and second control structures and first and second pointers to the first and second control structures, respectively, for the data file, wherein the first structure includes a plurality of pointers that respectively reference a plurality of bit maps that indicate available and allocated records of respective portions of usable space in the data file, and the second structure contains respective values that indicate quantities of available space in the respective portions of the data file;

limiting access to the first and second control structures to only a process that is expanding the data file while the process is expanding the data file;

allocating space for new versions of the first and second control structures in the control file;

copying contents of the first and second control structures to space for the new versions of the first and second control structures; and

updating the first and second pointers to reference the new versions of the first and second control structures[.];

determining whether the first structure is large enough to accommodate expansion of the data file by a requested amount;

performing the steps of allocating, copying, and updating only if the first structure is not large enough to accommodate expansion of the data file by the requested amount;

maintaining in-memory copies of the first and second pointers while the application data file is available for access; and

updating the in-memory copies of the first and second pointers to reference the new versions of the first and second control structures.

17. (Cancelled)

18. (Original) The article of manufacture of claim 16, wherein in a multi-host data processing arrangement for sharing the application data file, the computer-readable medium is further configured with instructions that cause a processor-based system to perform the step of transmitting a message from the first host to each other host after a

first host completes expanding the data file, wherein the message indicates that the file has been expanded.

19. *(Cancelled)*

20. (Original) The article of manufacture of claim 16, wherein a plurality of application programs share the data file and are hosted on a plurality of host data processing systems (hosts), and the computer-readable medium is further configured with instructions that cause a processor-based system to perform the step of conditioning expansion of a file shared by the application program on whether each host is configured to detect expansion of the data file by another host.

21. (Original) The article of manufacture of claim 20, wherein the computer-readable medium is further configured with instructions that cause a processor-based system to perform the step of, before expanding the data file by a first host, sending to each other host a message that queries whether the other host is configured to detect expansion of the data file by another host.

In the Title

Pursuant to MPEP 606.01 the Title is changed to read

***--METHOD AND APPARATUS FOR MAINTAINING, AND UPDATING
IN-MEMORY COPIES OF THE FIRST AND SECOND POINTERS TO REFERENCE
THE NEW VERSIONS OF THE FIRST AND SECOND CONTROL STRUCTURES
THAT INDICATE AVAILABLE AND ALLOCATED PORTIONS OF USABLE SPACE
IN THE DATA FILE —***

Reasons for allowance

Claims **1,3,5-7,12-16,18,20-21** are allowed

The following is an examiner's statement of reasons for indication of allowable subject matter: The prior art of record does not disclose, make obvious, or otherwise suggest the structure of the applicant's *"determining whether the first structure is large enough to accommodate expansion of the data file by a requested amount; and performing the steps of allocating, copying, and updating only if the first structure is not large enough to accommodate expansion of the data file by the requested amount"*, in Claim 1,16;

"updating the in-memory versions of the pointers to the control file versions of the second and third structures, with the control file versions of the pointers to the control file versions of the second and third structures", in Claim 7;

"updating the in-memory versions of the pointers to the control file versions of the second and third structures, with the control file versions of the pointers to the control file versions of the second and third structures, if the control file version and in-memory version of the pointer are not equal", in claim 14;

"means for determining whether the first structure is large enough to accommodate expansion of the data file by a requested amount; and

means, responsive to the first structure not being large enough to accommodate expansion of the data file by the requested amount", in Claim 15;


These features, together with the other limitations of the independent claims are novel and non-obvious over the prior art of record. The dependent claims 3,5-6, 12-13,18,20-21 being definite, enabled by the specification, and further limiting to the independent claims are also allowable.

The newly cited reference Dearth, Glenn et al. WO 2004/077229 published on 10 Sept 2004 is directed to structure and method for managing available memory resources, particularly, free pointers to respective free memory blocks are stored in memory blocks maintained as a linked list., partitioning a first portion of the memory into number of blocks [n blocks] and allocate "m" of the blocks as pointer blocks, each of which is adapted to store at most a "s" pointers. As the blocks are allocated and deallocated, pointers are respectively, removed from or added to the free pointer list, whereby the free pointer list dynamically expands and contracts so as to always accommodate the set of free pointers to all of the available blocks of the first portion of the memory [see Abstract, page 5-6].

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance".

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Alam, Hosain, T, can be reached on (571) 272-3978. The fax phone numbers for the organization where the application or proceeding is assigned is 571-273-8300. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free)

sc
Patent Examiner.
October 27, 2006.


SRIRAMA CHANNAVAJALA
PRIMARY EXAMINER

This Page is inserted by IFW Indexing and Scanning
Operations and is not part of the Official Record

BEST AVAILABLE IMAGES

Defective images within this document are accurate representations of the original documents submitted by the applicant.

Defects in the images include but are not limited to the items checked:

- ☒ BLACK BORDERS
- ☒ IMAGE CUT OFF AT TOP, BOTTOM OR SIDES
- ☐ FADED TEXT OR DRAWING
- ☐ BLURED OR ILLEGIBLE TEXT OR DRAWING
- ☐ SKEWED/SLANTED IMAGES
- ☐ COLORED OR BLACK AND WHITE PHOTOGRAPHS
- ☐ GRAY SCALE DOCUMENTS
- ☐ LINES OR MARKS ON ORIGINAL DOCUMENT
- ☐ REPERENCE(S) OR EXHIBIT(S) SUBMITTED ARE POOR QUALITY
- ☐ OTHER: _____

IMAGES ARE BEST AVAILABLE COPY.

As rescanning documents *will not* correct images problems checked, please do not report the problems to the IFW Image Problem Mailbox.